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ABSTRACT

This book contains "math mind benders," puzzles that are worked like crossword puzzles except that each square is filled with a digit rather than a letter. Clues to the puzzles are interrelated with each other and a given story. Clear thinking and deductive reasoning must be used to find potential answers and eliminate those that fail to meet all conditions. The puzzles present opportunities for discovering interesting facts about numbers and their interrelationships and some basic principles of elementary number theory. Contains teacher suggestions, answers, and detailed solutions to the 27 puzzles. (JRH)

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MATH MIND BENDERS® WARM UP

DEDUCTIVE REASONING MATHEMATICS

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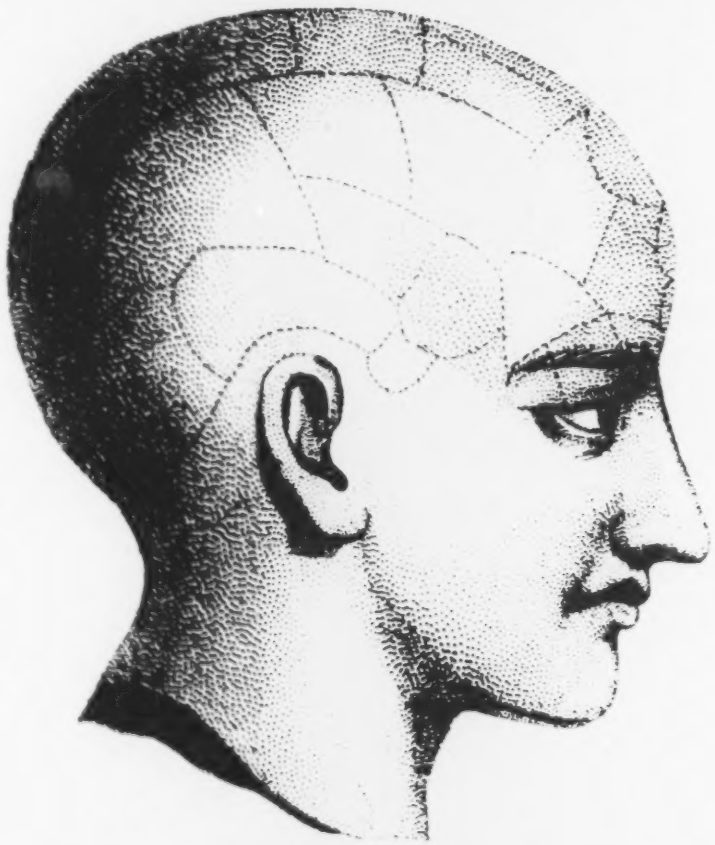

ANITA HARNADEK
CRITICAL THINKING PRESS & SOFTWARE

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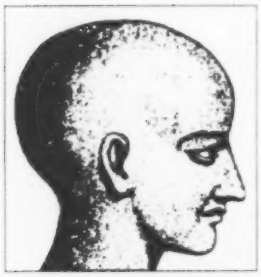
MATH MIND BENDERS®

WARM UP

DEDUCTIVE REASONING IN MATHEMATICS

ANITA HARNADEK



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Teaching Suggestions, Answers, and Detailed Solutions

About This Series

Math Mind Benders® are worked like crossword puzzles, but each square is filled with a digit rather than a letter.

No puzzle has routine clues such as "13 × 96." Instead, clues are interrelated with each other and a given story. Clear thinking and deductive reasoning must be used to find potential answers and eliminate those that fail to meet all conditions. Although several choices may at first seem equally acceptable, each puzzle has a **unique** solution.

Difficulty level cannot be determined from the size of the grid or the number of clues, for some puzzles in all booklets use the same 4 x 4 grid and the same number of clues.

These puzzles present a wealth of opportunity for discovering interesting facts about numbers and their relations to each other, at times merging with some basic principles of elementary number theory.

The use of calculators should be encouraged at all levels.

Each booklet includes a complete set of answers—explanations as well as grids.

Current titles in the **Math Mind Benders®** series are

Arithmetic:

Warm Up–1 (introductory)
Warm Up–2 (very easy)
Book A-1 (easy)
Book B-1 (medium)
Book C-1 (hard)

Reproduction rights for each booklet are limited to a single classroom.

About This Booklet

Although these puzzles are labeled as very easy, their easiness is in relation to the more difficult problems in the A-, B-, and C-level booklets. They are not easy in the sense that the average lower-elementary student could pick up a **Math Mind Benders® Warm Up–2** puzzle and do it without help, for both the arithmetic and reasoning ability needed are probably beyond that level.

It is strongly suggested that students master the **Math Mind Benders® Warm Up–1** material before starting on this booklet.

Teaching Suggestions

- Start your students off with the **Warm Up–1** booklet. Make sure they have mastered that material before moving to a higher level.
- Avoid adding to the inherent difficulties of these puzzles, and encourage your students to try more puzzles and thus increase their abilities to reason out answers to new challenges. ***Advocate the use of calculators.***
- Conclusions that are obvious to you may not be obvious to your students. Be patient. It encourages your students to be lazy about developing their reasoning powers when you always explain how to go about finding an answer. Instead, ask logical questions designed to help your students find the reasoning process themselves.
- Having students explain their reasoning is different from having you explain yours. Your students *expect* you to be able to figure things out (you're a *teacher*!), but they're more likely to try to think for themselves when they know how other students solved the problems.
- You may find that you would like to point to a particular part of a problem and have the whole class see it (for example, pages 9–11 of **Warm Up–1**). Make an overhead transparency of a page you think might be especially troublesome to your students.
- Some students enjoy the challenge of working alone on such puzzles, while others would rather be part of a team effort. Consider allowing both kinds of work simultaneously.

Answer Grids

1.

1	2 1	
3 9		4 1
	5 5	6

2.

1	2 6	
3 9		4 9
	5 3	5

3.

1	2 2	
3 8		4 7
	5 4	2

4.

1	2 1	
3 9		4 3
	5 1	0

5.

1	2 6	
3 2		4 1
	5 1	5

6.

1	2 6	
3 4		4 4
	5 1	7

7.

1 8	2 6	
3 1		4 3
	5 4	2

8.

1 4	2 4	
3 9		4 6
	5 5	4

9.

1 7	2 4	
3 2		4 1
	5 4	2

10.

1 5	2 6	
3 9		4 1
	5 2	0

11.

1	2 9	
3 8		4 7
	5 2	2

12.

1		2 2	3 3
4 6	5 9		6 8
7 1	4	8 4	
9 9		10 8	11 6

13.

1 2		2 3	3 7
4 2	5 1		6 7
7 2	6	8 1	
9 2		10 1	11 9

14.

1	2 7	
3 6		4 3
	5 2	3

15.

1	2 8	
3 5		4 7
	5 1	2

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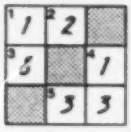
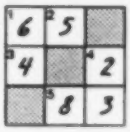
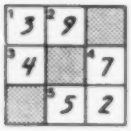
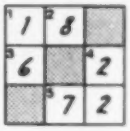
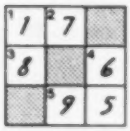
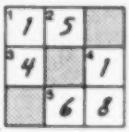
16. 

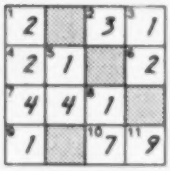
17. 

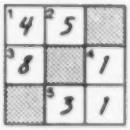
18. 

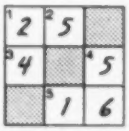
19. 

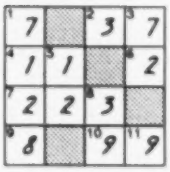
20. 

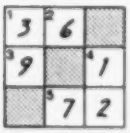
21. 

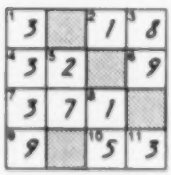
22. 

23. 

24. 

25. 

26. 

27. 

Detailed Solutions

1. 1-A can't be 10 (because 2-D can't be 0), and it is only 2 more than 3-A, a 1-digit number, so 1-A is 11. This forces answers for all clues.
2. A score of 80% shows correct answers for 80/100, or 4/5, of the words, so Jasmine spelled 4/5 of 20 = 16 words correctly. Then Arabella spelled 19 words correctly, a score of 19/20 = 95/100 = 95%. All other answers follow.
3. Stephanie is at least 11 (2-D can't be 0), so Alice is at least 7 but less than 10 (3-A). Her age is an even number (5-D), so she is 8. Then Stephanie is 12. 1-D (now known) forces 4-D.
4. The ages are three consecutive numbers. One of them (3-A) has only 1 digit, and the other two (1-A and 5-A) have 2 digits, so the numbers are 9, 10, and 11. Arturo can't be 10 (because 2-D can't be 0), forcing all three answers and, in turn, the other answers.
5. 27 is 3 more than twice Furedin's distance (blocks) from school, so 1-D is 12 and 5-A is 15. Then Furedin's age is in the range 11–19 (1-A) and Suna's age ends in 5 (4-D), so Suna is 15 and Furedin is 16.
6. The minutes on the digital clocks were 14, 16, and 17, a total of 47. This answers 4-D and forces all other answers.
7. Irina is twice as old as Jayne, so the sum of 9 is three times Jayne's age. This answers 4-A and forces answers for 2-D, 1-D, and 5-A.
8. The total yards run, 108, included 20 yards run by Johann but not by Katherine, so Katherine ran 88/2 = 44 yards (1-A), and Johann ran 20 + 44 = 64 yards (4-D). All answers are now forced. (Arithmetic for 5-A is [7 × (2 × 4)] – 2.) Johann ran 64 yards in 9 seconds, an average of 7 ⅛ yps, while Katherine's average was 44/6, or 7 ⅓ yps, so Katherine won.
9. The chosen numbers totaled 5 or more (4-D has 2 digits), so the numbers were 4 and 2. For 5-A, the sum wanted is 4 + 2 = 6, and the product of 6 and the missing digit must end in 2. Choosing from the digits 1–9 for the multiplier, only 6 × 2 and 6 × 7 end in 2. The missing digit can't be 2, for that would make 1-D = 22, a palindromic number. So the missing digit is 7, and all answers are now known.
10. Karl had one more dime than he had nickels. Since 4-D has 2 digits and 3-A has only 1 digit, answers are forced for both, as well as for 2-D. For 5-A, we have a partial sum of 15 (from 3-A + 2-D), so to make 5-A end in 0, the missing addend must be 5, forcing all missing answers.
11. The total of 59 comics is 7 less than 3 × *News* comics, so comics are 22 for *News* (5-A), 19 for *Times* (1-A), and 18 for *Sentinel* (1-D). This forces the other answers.
12. 35 is 3 more than twice Luis' age, so Luis is 16, Max is 19, and Jordan is 23. This answers 1-D and 2-A. Other answers follow easily in the order 4-A, 7-A, 3-D, 8-D, 10-A.
13. 8-D is 2 more than 11-D. 10-A can't start with 0, so 8-D and 11-D are 11 and 9. Answers follow for 10-A and 7-A. Then Andrew's earnings were $231, so answers follow for 3-D, 4-A, 1-D, and 2-A.
14. The sum of the distances, 40, is 6 more than twice Centerville's distance, so Centerville's distance (1-A) is 17 and Middleton's (5-A) is 23. Answers follow for 4-A and 1-D.

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15. 5-A is divisible by 3 (see 2-D), so 5-A and 1-D are either 12 and 15, or 15 and 18. If 15 and 18, then 2-D would be 10, a 2-digit number. Therefore, 5-A and 1-D are 12 and 15, and all other answers are forced. (Answer the "DOWN" clues first.)

16. 3-A has only one digit, while 1-A and 4-D have two digits. The only way to make 4-D and 5-A have the same last digit is to have a total of 20 for 1-A and 3-A. At the same time, 4-D must be more than 1-A and exactly 5 more than 3-A. This narrows the possibilities for 1-A and 3-A to 11 and 9, or 12 and 8. But 1-D must be even (given), so all answers are determined.

17. Look at 5-D, 1-D, and 3-A. Only one number (8) has a square whose second digit is half of the number. All other answers now follow.

18. The sum of 3-A and 2-D is 13 (given), so 5-A is 52. This gives us 5-D, which forces answers of 9 and 4 for 2-D and 3-A. Now 4-A is forced. 4-D forces the first digit of 1-A and 1-D.

19. Ruth's auto mechanics and civics classes start at either 8 and 11, or 9 and 12. If at 9 and 12, then her English and math classes start at 8 and 10, contradicting the given information that her history class meets earlier than her English class. So Ruth's schedule of classes, starting with the 8 o'clock class is: auto mechanics, history, English, civics, math. All answers are now forced. (For 1-D, consider that we know 3-A and that Yves is younger than Ruth, a teenager.)

20. If two one-digit numbers are added, and if their sum's second digit is one less than one of the numbers, then the other number has to be 9. Applying this reasoning to 1-A and 2-D results in an answer for 5-D and, consequently, for all other clues.

21. Only 1-digit numbers were chosen (3-A, 2-D, 5-D). The only combination having a sum whose second digit is one of the numbers is 4, 5, 6. This forces 1-A, 2-D, 3-A, and 5-D, in turn forcing 4-D.

22. Joan is 3 years older than Nathan, and Cordell is 5 years older than Nathan, so the sum of the ages, 35, is 8 more than 3 × Nathan's age. Then Nathan is 9 (11-D), Joan is 12 (3-D), and Cordell is 14 (5-D). All other answers follow. (It is helpful to find them in the order of 4-A, 7-A, 8-D, 1-D, 2-A.)

23. The colon in the second sentence indicates that the four kinds of pets named totaled 27. We can easily figure four times the number of canaries by starting with 27 and subtracting 3 (extra puppies) and 6 (extra kittens) and adding 2 (fewer gerbils) for a total of 20. Then there were 5 canaries (2-D), 8 puppies (3-A), 11 kittens (4-D), and 3 gerbils (5-D). 1-D is now forced.

24. 3-A is a one-digit number, so 1-A and 1-D are both in the 20s, thus accounting for 40 of the 53 tickets sold. Of the remaining 13, two parts are equal (3-A and last digit of 1-D), and the third part is 1 more than the other two parts. It follows that if we subtract 1 from the total of 13, we will have three times one of the two equal parts, so 3-A is 4, and 2-D is 5. All other answers follow.

25. $1.71 was 27¢ more than twice Mary Lou's cost, so 3-D is 72, and 10-A is 99. Answers follow for 1-D, 4-A, 5-D, 8-D, and 2-A.

26. The total of 21 is 3 more than twice Wanda's yardage, so 3-A is 9 and 4-D is 12. Then 135 is 9 more than 21 × Patrice's average per yard, and so 2-D is 6, and answers follow for 5-D and 1-A.

27. See 8-D and 10-A. Only two combinations here will make Nuri's number prime—15 and 53, or 51 and 17. 7-A forces the choice of 15 and 53. This, in turn, forces all of the following: 5-D and 6-A, 1-D, 2-A.

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REMINDERS

- All answers are positive whole numbers.
- No puzzle tries to trick you. For example, suppose the story above the clues tells you that Chi-Tan works at a job after school. If a clue asks for Chi-Tan's hours worked, it means "worked at the job mentioned in the story."

- You get the SUM of two numbers when you ADD the numbers.
- You get the DIFFERENCE between two numbers when you SUBTRACT one number from the other.
- You get the PRODUCT of two numbers when you MULTIPLY the numbers.
- You get the QUOTIENT of two numbers when you DIVIDE one number by the other.

- A PALINDROMIC number is a number that reads the same both forwards and backwards.
- The SQUARE of a number is the result of multiplying the number by itself.
- A PRIME number is a number that is divisible only by itself and one other number.

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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

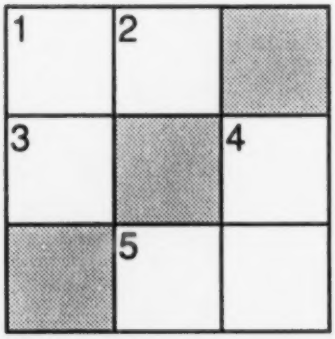
1. Daniel is 5 years older than his sister Korinna, who is 2 years older than their sister Sheila. The family's parakeet, Flighty, is six months old and can say ten words.

ACROSS

1. Korinna's age
3. Sheila's age
4. Orange and purple striped sweatshirts Daniel has
5. One more than sum of ages of Daniel, Joel, Korinna, and Sheila

DOWN

1. Age of Joel, brother of Daniel, Korinna, and Sheila
2. German Shepherds the family has
4. Daniel's age
5. Age of Spot, the family's cat



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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

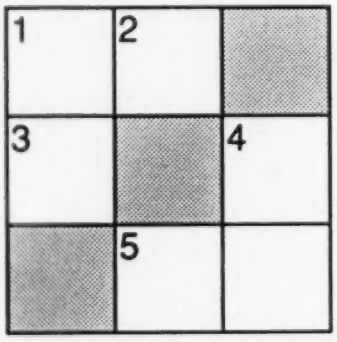
2. Jasmine scored 80% on a 20-word spelling test. Arabella misspelled 3 fewer words on the test than Jasmine. Their teacher, Mr. Soslowski, didn't misspell any of the words.

ACROSS

1. Words Jasmine spelled right
3. Arabella's age
4. Jasmine's age
5. Sum of 1-A and 1-D

DOWN

1. Words Arabella spelled right
2. See 5-D
4. Arabella's score (%) on the test
5. Half of 2-D



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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

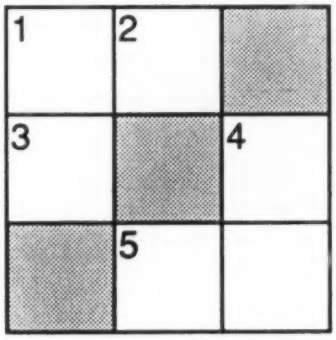
3. Stephanie is 4 years older than Alice, who takes ballet lessons Saturday mornings but would rather play touch football.

ACROSS

1. Stephanie's age
3. Alice's age
4. 9 less than age of Alice's oldest brother
5. Pizzas Alice has eaten so far this year

DOWN

1. 1/4 of 4-D
2. Sandwiches Stephanie ate for lunch
4. Sum of ages of Stephanie's parents
5. Half of Alice's age



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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

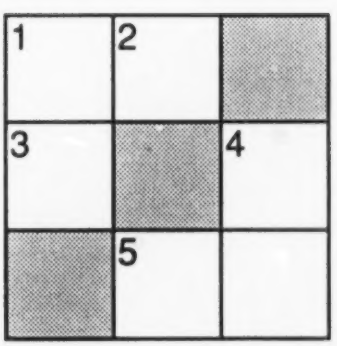
4. Arturo, Jason, and Mavis are neighbors. One of them is a year older than another of them but a year younger than the third.

ACROSS

1. Arturo's age
3. Mavis's age
4. Computer programs Arturo has written
5. Jason's age

DOWN

1. Cars with bumper stickers Mavis saw yesterday
2. Age of Jason's dog, Mutt
4. 1-A + 1-D
5. Age of Jeanne, who lives next door to Jason



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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

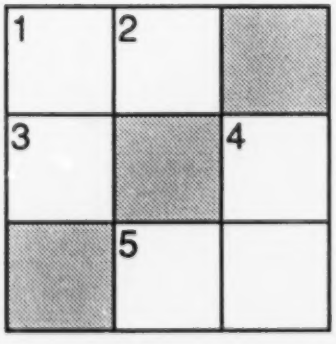
5. Suna, who is a year younger than Furedin, lives 3 blocks farther from school than Furedin lives. The sum of the blocks they live from school is 27.

ACROSS

1. Furedin's age
3. Years Suna has been a cheerleader
4. Years Furedin has been first-string quarterback
5. Blocks Suna lives from school

DOWN

1. Blocks Furedin lives from school
2. Furedin's football jersey number
4. Suna's age
5. Years Suna has been in the school choir



12

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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

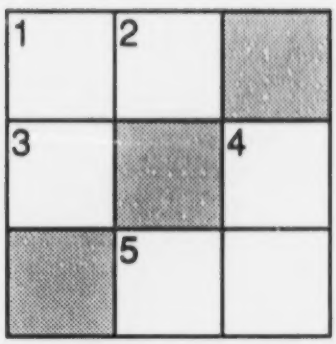
6. There are three digital clocks in Brad's house. At fifteen minutes past one o'clock yesterday afternoon, one of the clocks was two minutes fast, one was one minute fast, and the other was one minute slow. (The order in which the clocks are mentioned here might not match their numbers in the clues below.)

ACROSS

1. Minutes shown on digital clock #1
3. Same as 4-A
4. See 3-A
5. Minutes shown on digital clock #2

DOWN

1. Minutes shown on digital clock #3
2. Clocks (including nondigital) in Brad's house
4. Total minutes shown on digital clocks at 1:15 P.M. yesterday
5. Sundials in Brad's back yard



13

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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

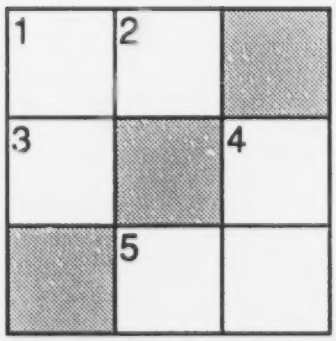
7. Irina is twice as old as her sister Jayne. The sum of their ages is 9. Their father is 7 times as old as Irina.

ACROSS

1. Age of father's grandmother
3. Children next door who are younger than Jayne
4. Jayne's age
5. Father's age

DOWN

1. Square of sum of 2-D and 4-A
2. Irina's age
4. Mother's age
5. Near neighbors between Irina's and Jayne's ages



14

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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

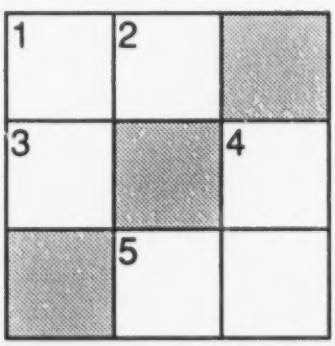
8. Katherine and Johann competed to see who could run the fastest. They had a misunderstanding about where the race ended, and Johann ran 20 yards farther than Katherine ran, taking 3 seconds more than she took. The total number of yards they ran was 108. Who won?

ACROSS

1. Yards Katherine ran
3. Seconds Johann ran
4. Seconds Katherine ran
5. 2 less than the product of the square root of 1-D and double 2-D

DOWN

1. Races between Johann and Katherine in the past six months
2. Last digit of Johann's address
4. Yards Johann ran
5. Friends of Katherine and Johann who watched the race



15

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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

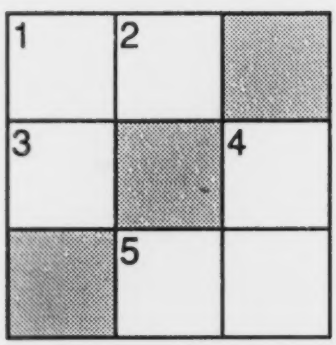
9. Alene and Jerome each chose a whole number less than 5. The number Alene chose was 2 less than the number Jerome chose. In this puzzle, no answer is palindromic.

ACROSS

1. See 5-A
3. Alene's number
4. First digit of 4-D
5. Product of first digit of 1-D and sum of 2-D and 3-A

DOWN

1. See 5-A
2. Jerome's number
4. Twice the sum of the numbers chosen
5. Days until Jerome's next piano lesson



16

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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

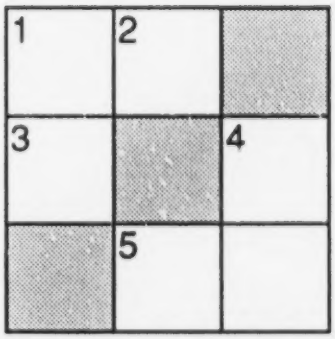
10. Karl found that he had quite a bit of loose change in his pocket at the end of the day. He had 4 more dimes than quarters and 3 fewer quarters than nickels.

ACROSS

1. Karl's favorite TV channel
3. Nickels Karl had
4. Years Karl has been studying Sanskrit
5. 3-A + 2-D + first digit of 1-D

DOWN

1. Age of Karl's Sanskrit teacher
2. Quarters Karl had
4. Dimes Karl had
5. Pennies Karl had



17

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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

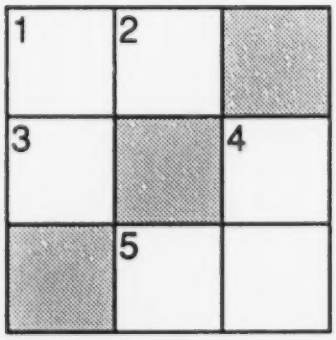
11. *Morning News*, *Afternoon Sentinel*, and *Evening Times* run a total of 59 daily comic strips, *News* running 3 more than *Times* and 4 more than *Sentinel*.

ACROSS

1. Comics run by *Times*
3. Age of Monica, who reads the comics in *News*
4. Age of Michael, who reads the comics in *Sentinel*
5. Comics run by *News*

DOWN

1. Comics run by *Sentinel*
2. Age of Marty, who reads the comics in *Times*
4. Product of 2-D and 3-A
5. 5-A divided by difference between 1-A and 3-A



18

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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

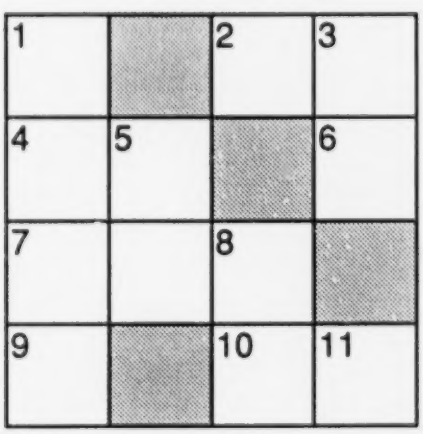
12. The sum of the ages of Luis and Max is 35. The difference between their ages is 3. Max is older than Luis but 4 years younger than Jordan, Max's brother.

ACROSS

1. Telephone calls Max made before noon yesterday
2. Jordan's age
4. 3 × 2-A
6. Years Jordan lived in New York
7. Square of ¾ of Luis' age
9. Handball games Max played yesterday
10. 3-D + 8-D

DOWN

1. First two digits are Luis' age; last two digits are Max's age
2. Touchdowns Luis scored in last week's football game
3. 2 × Max's age
5. Age of Jordan's great-great-grandfather
8. 3 × Luis' age
11. Volleyball games Jordan played yesterday



19

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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

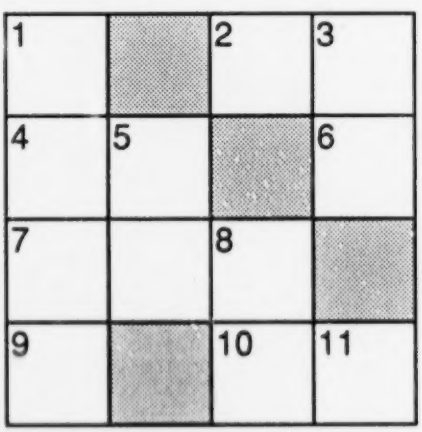
13. Andrew earns $2 more an hour than Barbara, who earned $30 more last week than Andrew. All amounts earned were at straight time.

ACROSS

1. First digit of 1-D
2. Sum of 4-A and 5-D
4. Andrew's hours worked last week
6. Months Andrew has worked at his job
7. Amount Barbara earned last week
9. 1-A × difference between 2-D and 1-A
10. 10 less than Barbara's hours worked last week

DOWN

1. Difference between 3-D and product of 10-A and square of 8-D
2. See 9-A
3. One-third of amount Andrew earned last week
5. Barbara's age eight years ago
8. Andrew's hourly rate
11. Barbara's hourly rate



20

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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

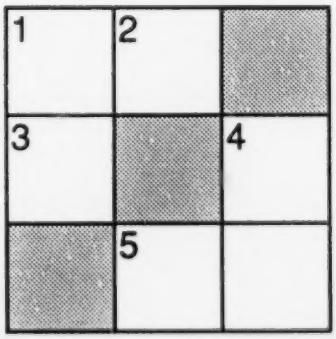
14. Middleton is 6 miles farther from Big City than Centerville is. The sum of their distances from Big City is 40 miles.

ACROSS

1. Distance of Centerville from Big City
3. Age of Janine Latimer, who lives in Middleton
4. 2-D divided into sum of 1-A and square of 5-D
5. Distance of Middleton from Big City

DOWN

1. Difference between 4-D and 1-A
2. Age of Jerry Parker, who lives in Centerville
4. Distance between Centerville and Middleton
5. Cities of over 50,000 population between Centerville and Big City



21

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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

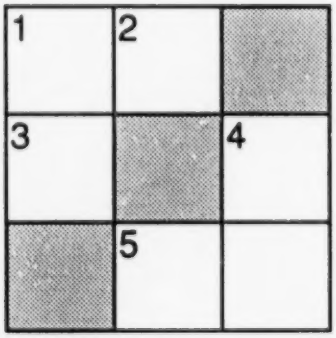
15. Last month Jody ate 3 more hamburgers than Angelo. Both had them with catsup, mustard, onion, and pickle. Each had fewer than 20.

ACROSS

1. One-fourth of 4-D
3. One-sixth of sum of 1-A and 5-A
4. Difference between 5-A and 3-A
5. Hamburgers Angelo ate

DOWN

1. Hamburgers Jody ate
2. Two-thirds of 5-A
4. Sum of 1-D and 5-A, with answer's digits reversed
5. Scrambled eggs eaten with each hamburger



22

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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

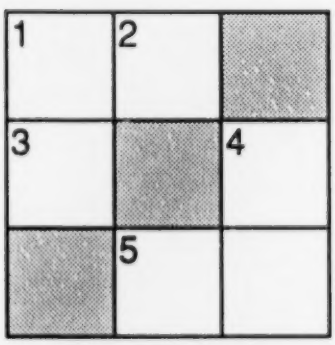
16. Phyllis has more cousins than Marla and fewer than Raymond. Raymond has 5 more than Marla. All aunts and uncles of the three are married.

ACROSS

1. Phyllis's cousins
3. Marla's cousins
4. Red-haired cousins of Phyllis
5. Total cousins of Phyllis, Marla, and Raymond

DOWN

1. Total aunts and uncles of Phyllis, Marla, and Raymond
2. Age of Raymond's youngest cousin, Suki
4. Raymond's cousins
5. Cousins of Marla under 5 years old



23

In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

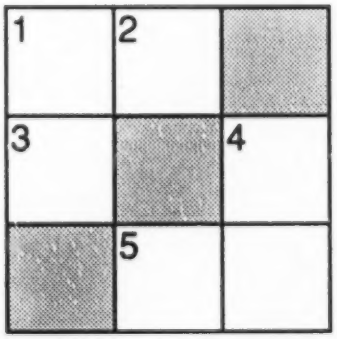
17. Anya's family went to the municipal park for a picnic. Some of them got sunburned, but Anya didn't because she wore sunscreen.

ACROSS

1. Age of Anya's grandfather
3. Half of 5-D
4. Fried chickens taken to picnic
5. Age of Anya's mother, with digits reversed

DOWN

1. Square of 5-D
2. Sum of digits of 4-D
4. 9 less than half of 1-D
5. People in Anya's family



21

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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

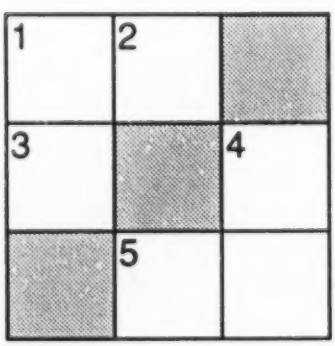
18. Tara has recruited 13 new subscribers for her newspaper route in the past two weeks. She did better the second week than she did the first week, and if she continues to do as well for the next four weeks, she will win a trip to Washington, D.C.

ACROSS

1. See 4-D
3. New subscribers first week
4. 2 less than 2-D
5. 4 × sum of 3-A and 2-D

DOWN

1. See 4-D
2. New subscribers second week
4. 1 less than sum of 1-A and 1-D
5. Difference between 2-D and 3-A



25

In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

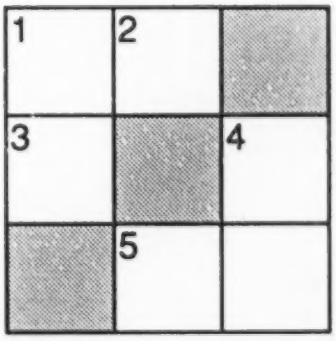
19. Classes at Adams High School start on the hour. Ruth, a teenager, takes five consecutive classes, her first class starting at 8. Her math class starts two hours later than her English class. Her auto mechanics class starts three hours before her civics class. Her history class meets earlier than her English class.

ACROSS

1. Last two digits of room number where Ruth's English class meets
3. Half the starting time of Ruth's math class
4. Years Ruth has been in the high school choir
5. One-fourth of product of 1-A and 1-D

DOWN

1. Age of Ruth's younger brother Yves
2. Starting time of Ruth's auto mechanics class
4. Twice the starting time of Ruth's civics class
5. Tennis games Ruth won yesterday



26

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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

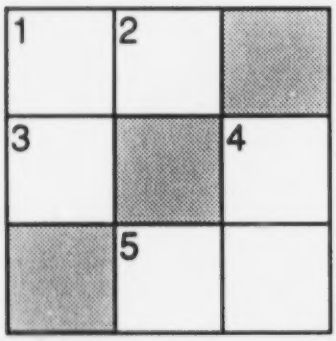
20. A zebra, who was a year older than a black horse, was very proud of his stripes and made fun of the horse for being a solid color. The horse replied that the zebra looked as though someone had painted him with cheap paint and left him out in the rain.

ACROSS

1. Sum of ages of horse and zebra
3. Age of horse
4. One-third of 1-D
5. Points where zebra's stripes meet

DOWN

1. Stripes on zebra's nose
2. One less than 3-A
4. 2-D × 3-A, with answer digits reversed
5. Age of zebra



27

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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

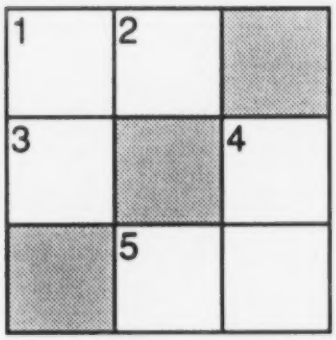
21. Geraldine, Helga, and Jacob are thinking of three consecutive numbers. Helga's number is less than Geraldine's.

ACROSS

1. Sum of the three numbers chosen
3. Helga's number
4. Number Geraldine chose before she changed her mind
5. Helga's age

DOWN

1. Jacob's age
2. Geraldine's number
4. What the sum would have been had each person chosen a number one higher than the number chosen
5. Jacob's number



28

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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

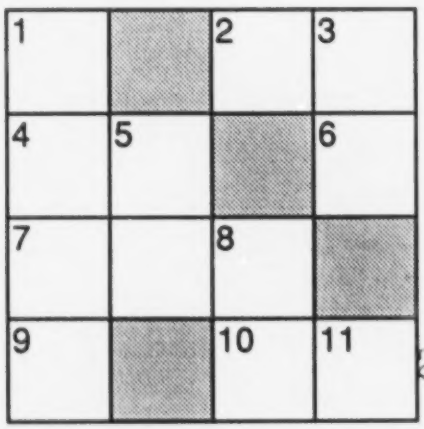
22. Joan is 3 years older than Nathan and 2 years younger than Cordell. The sum of the three ages is 35.

ACROSS

1. Kilometers Nathan lives from school
2. Sum of digits of 1-D, 5-D, 8-D, and 11-D
4. Sum of 3-D and 11-D
6. Kilometers Joan lives from school
7. Square of 4-A
9. Kilometers Cordell lives from school
10. Sum of ages of Joan's parents

DOWN

1. Product of 6-A, 10-A, and 11-D, with digits of answer reversed
2. Kilometers Cordell lives from Nathan
3. Joan's age
5. Cordell's age
8. 5 more than 3-D
11. Nathan's age



29

In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

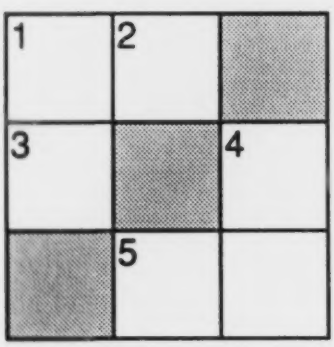
23. Nikolai's favorite store is Pet Land, a pet shop half a mile from his home. Yesterday he looked in the window and saw 27 pets for sale: there were 3 more puppies than canaries, 6 more kittens than canaries, and 2 more canaries than gerbils.

ACROSS

1. Total pets in Pet Land, including those that Nikolai didn't see
3. Puppies Nikolai saw
4. Parrots at Pet Land that Nikolai didn't see
5. One more than twice Nikolai's age

DOWN

1. 3-A × sum of digits of 5-A and 4-D
2. Canaries Nikolai saw
4. Kittens Nikolai saw
5. Gerbils Nikolai saw



30

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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

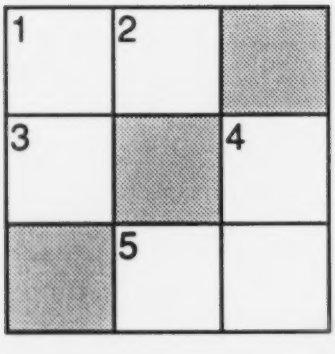
24. Antal, Casimir, and Edward sold a total of 53 tickets to the school play. Antal sold 1 more ticket than Casimir. Edward sold the least number of tickets.

ACROSS

1. Tickets Antal sold
3. Tickets Edward sold
4. Hours Casimir spent selling tickets
5. Square of 3-A

DOWN

1. Tickets Casimir sold
2. Hours Antal spent selling tickets
4. 2-D × sum of digits of 1-A and 1-D, with answer's digits reversed
5. Hours Edward spent selling tickets



31

In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

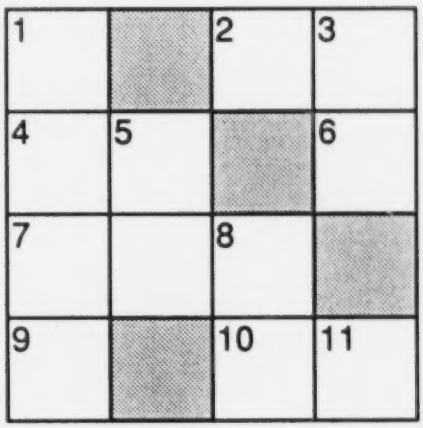
25. Yvette, who is 2 years older than Mary Lou, paid 27¢ more for a 9-ounce jar of jelly than Mary Lou paid for 6 ounces of the jelly. The total they paid for the two jars was $1.71.

ACROSS

1. Third jar size of jelly available (ounces)
2. Mary Lou's age
4. Price (¢) per ounce Yvette paid
6. Boxes of corn flakes Yvette bought
7. Cost (¢) of oatmeal Mary Lou bought
9. Items Mary Lou bought
10. Cost (¢) of Yvette's jar of jelly

DOWN

1. Product of 3-D and 10-A
2. Trips to supermarket Mary Lou made last week
3. Cost (¢) of Mary Lou's jar of jelly
5. Price (¢) per ounce Mary Lou paid
8. Yvette's age (1 more than sum of digits of 1-D, 4-A, and 10-A)
11. Items Yvette bought



32

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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

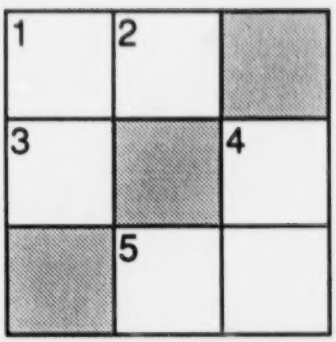
26. Wanda and Patrice bought a total of 21 yards of material for $135. Wanda bought 3 fewer yards than Patrice, paying an average of $1 a yard more than Patrice.

ACROSS

1. Total Wanda spent, with digits reversed
3. Yards Wanda bought
4. Yards of ribbon Patrice bought
5. Total Patrice spent

DOWN

1. Wanda's age
2. Patrice's average ($) per yard
4. Yards Patrice bought
5. Wanda's average ($) per yard



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In the clues, "A" means across and "D" means down. For example, "4-D" would refer to clue number 4 DOWN.

Each square takes a single digit from 0 through 9. No answer begins with 0.

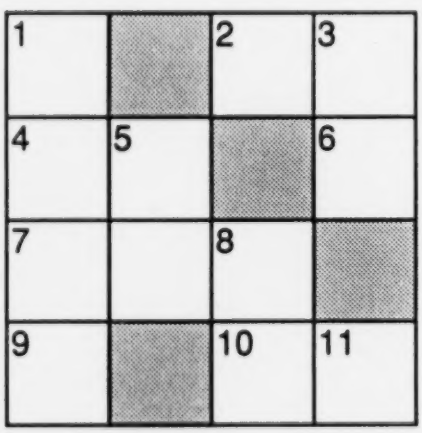
27. Jamison and Gargi each chose a number. The sum of their numbers was 36. Martina and Nuri also chose two numbers, and the sum of their numbers was 68. Nuri's number was prime.

ACROSS

1. Gargi's age 9 years ago
2. Sum of digits of 1-D
4. Jamison's age 10 years from now
6. Jamison's number
7. 7 × 10-A
9. Martina's age
10. Nuri's number

DOWN

1. Product of 6-A and 7-A
2. Half of Nuri's age 12 years ago
3. Gargi's favorite prime number
5. Gargi's number
8. Martina's number
11. Age of Martina's youngest brother



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